

Patent Claims

1. A flange arrangement of an engine cylinder head, characterized in that the flange arrangement (2, 14, 25) has at least two single-piece individual flanges (1a-d, 13a-c, 26), which bear against one another with in each case at least one peripheral region (8a-d, 15, 20, 28, 29) overlapping, in such a manner that in the overlapping area their securing bores (3, 16, 27) for attaching them to the cylinder head (22) are aligned.
2. The arrangement as claimed in claim 1, characterized in that the individual flanges (1a-d) have a shoulder (2) which reduces their wall thickness and comprises the location of their peripheral regions (8a-d) which overlap, the individual flanges (1a-d) bearing against one another by means of their shoulders (9).
3. The arrangement as claimed in claim 1, characterized in that the individual flange (13a-c, 26) has a wall thickness which is at least substantially uniform over its entire extent, and in that the overlapping first peripheral region (15, 28) of the individual flange (13a-c, 26), which covers the corresponding second peripheral region (20, 29) of another individual flange (13a-c, 26) toward the side (18) remote from the cylinder head, is offset toward the side (18) remote from the cylinder head with respect to its overlapping second peripheral region (20, 29), which covers the corresponding first peripheral region (15, 28) of another individual flange (13a-c, 26) toward the side facing the cylinder head.
4. The arrangement as claimed in one of claims 1 to 3, characterized in that the passage opening (6, 17) in the individual flange (1a-d, 13a-c, 26) has an encircling rim (19) on the side (18) remote from the cylinder head.
5. The arrangement as claimed in one of claims 1 to 4, characterized in that the individual flange (1a-d, 13a-c, 26), on the edge side outside the overlap zone (12, 21, 31), has a rim (23, 30) which projects perpendicularly toward the side (18) remote from the cylinder head.

6. The arrangement as claimed in claim 5, characterized in that the individual flange (1a-d, 13a-c), on the edge side of the circumferential region (8a, 8b, 8d, 15) which forms a cover toward the side (11, 18) remote from the cylinder head, has a reinforcing rib (24) which projects in the same direction.
7. The arrangement as claimed in one of claims 1 to 4, characterized in that the individual flange (13a-c, 26), on the edge side, has a rim (23, 30) which faces away from the cylinder head (22) and runs continuously all the way around with the exception of the second peripheral region (20, 29) which is covered by another individual flange (13a-c, 26) toward the side (18) remote from the cylinder head.
8. A process for producing a flange arrangement of an engine cylinder head, characterized in that the flange arrangement (2, 14, 25) is composed of single-piece individual flanges (1a-d, 13a-c, 26), and in that the individual flanges (1a-d, 13a-c, 26) are placed against one another with in each case at least one peripheral region (8a-d, 15, 20, 28, 29) overlapping, in such a manner that the securing bores (3, 16, 27) which are formed in the peripheral region (8a-d, 15, 20, 28, 29) of the individual flanges (1a-d, 13a-c, 26) are aligned with one another.
9. The method as claimed in claim 8, characterized in that the outer contour (10), the securing bores (3, 16, 27) and the passage opening (6, 17) of the individual flanges (1a-d, 13a-c, 26) are produced by punching.
10. The method as claimed in either of claims 8 and 9, characterized in that the individual flanges (1a-d) are designed with at least one shoulder (9) which reduces the wall thickness and comprises the location of their overlapping peripheral regions (8a-d), and in that the individual flanges (1a-d) are placed with their shoulders (9) against one another.
11. The method as claimed in claim 10, characterized in that to form the shoulder (9), the individual flange (1a-d) is stamped at the corresponding location, and in that the

flange material which has been displaced by the stamping operation and projects laterally beyond the edge of the flange (1a-d) is cut off.

12. The process as claimed in claim 11, characterized in that the cutting of the flange (1a-d) takes place in a final punching operation, in which the flange contour (10) is precision-punched after it has been rough-prepunched.
13. The process as claimed in claim 8, characterized in that the individual flanges (13a-c, 26) are deep-drawn from a planar sheet-metal blank, with an overlapping first peripheral region (15, 28) of the individual flange (13a-c, 26), which covers the corresponding second peripheral region (20, 29) of another individual flange (13a-c, 26) toward the side (18) remote from the cylinder head, being formed so as to be offset toward the side (18) remote from the cylinder head with respect to its overlapping second peripheral region (20, 29), which covers the corresponding first peripheral region (15, 28) of another individual flange (13a-c, 26) toward the side facing the cylinder head.
14. The process as claimed in claim 13, characterized in that after the deep-drawing of the flange (13a-c, 26) the securing bores (16, 27) and the passage opening (17) are punched out.
15. The process as claimed in claim 13 or 14, characterized in that a rim (19, 23, 30) which faces toward the side (18) remote from the cylinder head is formed by the deep-drawing operation at the same time as the first peripheral region (15, 28) on the edge side of the flange (13a-c, 26) and around the passage opening (17) is being formed.